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A McKinley family affair

Three brothers use engineering to directly impact both the medical and science communities

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It is fairly unusual for siblings to attend the same college or university. It is even more unusual for those same siblings to study the same thing and work together on projects that have the potential to change the world. However, that is exactly what the McKinley brothers are doing. Michael, Stephen and Jonathan McKinley are all current University of California Berkeley students studying mechanical engineering and working on projects both as a team and as individuals.

Michael, the eldest McKinley and a post-doctorate student at Berkeley, just finished his PhD. in mechanical engineering and was jointly hired by UC Berkeley and US Bionic, a company that focuses on developing mobility solutions. "It's kind of amazing," Michael said of his employment. "I wake up every morning and worry that I have to finish my thesis, but it's already done."

Michael's job aims to develop technology that can help anyone from able-bodied construction workers to fully paralyzed individuals through several different technologies. He works on both active and passive devices, which can help improve posture (passive) or help a paraplegic to walk (active). "It's cool to be able to see the whole spectrum of needs over the five years that I've been working here," he said.

In 2011, McKinley debuted the Austin Project, a robotic exoskeleton he had developed, along with the Berkeley Robotics and Human Engineering Laboratory, for 2005 Duxbury High School graduate Austin Whitney.

Since then, he has spent his time improving the technology, allowing seven other people to regain mobility with the exoskeleton. "It has been interesting to see how this technology is able to directly impact individuals and allow them to do new things," he said. Though his line of work is not easy, there is a silver lining: when the technology and devices are stable, the developers get to test their limits.

"We get a good day of playing around, basically," he said. "We try to see if we can walk on certain terrain or play soccer and try to figure out how we can improve the performance of the device even more." While Michael is working on mobility, Stephen, the middle McKinley brother, is returning to Berkeley after finishing a project with a startup in San Diego. After working with the start up for a year, Stephen accepted a research job in Berkeley and has only a handful of semesters left before his PhD. thesis.

"I like to have a multitude of projects to work on and bounce between," Stephen said. Stephen sees engineering as a "giant toolbox," which he can use to create something from nothing. Much of his background is in renewable energy and large-scale storage for energy. "I am more of a designer than anything else," he said. "It's the abstract concept that appeals to me." Jonathan, a senior at Berkeley, is spending his summer doing research for a company that utilizes recyclable materials to create roof tiles. He operates his own lab and works to create full-scale tiles that could be used on slum houses in India. With half of the company working in India, Jonathan is learning how to bridge cultural gaps.

"One of the more interesting aspects is learning how to communicate with my bosses, who are all over in India," he said. "Trying to work in the United States to solve a problem that doesn't occur here is challenging, but exciting."

The interest in mechanical engineering started as children, when the McKinley brothers would spend hours working on their lab in the basement. While in high school, Jonathan spent two years working on a complex violin. "It was incredible," he said. "It took me outside the realm of physical violin playing and took it to an engineering- based

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realm."

Michael, a born leader according to Stephen, said he has always known what he wants to do and appreciates working in the industry. While many of his relatives are in the medical field, Michael found a way to help fellow humans in the engineering world. "I've always felt that one of my biggest gifts in life is having the knowledge of what I wanted to do," Michael said. "It's been very clear to me that I've been put on this earth to make things and to use my hands to help people with what I can create." The brothers spent much of their youth working in a lab that Michael says it took him until graduate school to recreate.

"When we moved into our house, the basement had just one bare light bulb," he said. "Over time the three of us continually improved our skills, learned to use new tools and pushed each other. It was fun to bounce ideas off of each other and innovate."

All three brothers credit their parents with being supportive of their interests and for creating a space where they were unafraid to fail. While at Berkeley, the brothers did get a chance to work in the same lab, and agreed that having teammates in the lab made it significantly easier to work on projects.

"You don't really need to communicate, you just know what the other ones going to do," Michael said. "It's instant knowledge of how the other people on your team work, as opposed to spending time getting to know new colleagues."

While the brothers are all exploring different avenues of mechanical engineering, they still bond over their shared love and enthusiasm for the field and hope to work together in the future.

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